

PROPOSED LEAKING UST (LUST) CASE CLOSURE

The Arizona Department of Environmental Quality (ADEQ) is considering closure of the following leaking underground storage tank (LUST) case:

LUST Case File #5410.01

Facility ID # 0-009574

Maricopa County

Circle K Store #2706664 (former Shell Station #120768)

17125 E. Shea Blvd.

Fountain Hills, Arizona 85268

The Circle K Store #2706664 is located at 17125 E. Shea Boulevard in Fountain Hills. The facility currently operates as a retail petroleum station with a car wash and convenience store. This facility was the former Shell Station #120768. The UST owner/operator was identified as Shell Oil Products US (Shell). According to documentation, there have been an estimated six above ground storage tanks (ASTs) and two USTs were in service from 1978 until they were removed in 1998. UST closure activities were completed by the property owner in 1998. An investigation of the UST tank pit and associated piping was completed in 2000. LUST release .01 was assigned in 1999.

Shell and its consultants have conducted corrective actions at the site since July 1999. In 2004 and 2005, Miller Brooks Environmental installed numerous soil confirmation borings in the vicinity of the LUST release and also conducted other site investigations. No chemicals of concern (CoCs) were reported over applicable residential Soil Remediation Levels (rSRLs), or Groundwater Protection Levels (GPLs). The deepest detected CoC was methyl tert butyl ether (MTBE) at 25 feet below ground surface (bgs) in SB19-25. In November 2007, URS Corporation (URS) assumed groundwater monitoring and other remedial activities at the site. Quarterly groundwater monitoring and sampling events occurred between November 2007 and February 2015. URS also installed two off-site monitoring wells (MW-8 and MW-9) across Shea Boulevard east of the site in 2013. In 2014, MW-8 was abandoned due to property development at that location, but MW-9 was retained.

GES became Shell's consultant in February 2015. PersulfOx®, which promotes rapid and sustained *in situ* oxidation of a wide-range of organic contaminants like petroleum hydrocarbons, was used to remediate groundwater. Injections into specific monitoring wells occurred in May and August 2017. Groundwater results show that MTBE concentration remains above the applicable Tier 1 Corrective Action Standard of 94 µg/L in MW-1 and MW-5. The results for all other monitoring wells show no contamination present over applicable regulatory standards and the data is available in the LUST file.

Data provided by GES, and all other available site information has been used by ADEQ to determine whether remaining levels of contaminants at the site are adequately protective of human health and the environment. A site-specific risk assessment and detailed file/information search were also completed.

Based upon the results of remedial activities and site-specific information, the above-referenced LUST site is eligible for alternative LUST closure under Arizona Revised Statutes (A.R.S.) §49-1005(E). Arizona Administrative Code (A.A.C.) R18-12-263.04 allows case closure of a LUST site with groundwater contamination above the Arizona AWQS or Tier 1 Corrective Action Standards. ADEQ has considered the results of a site specific assessment and the rule-specific criteria below:

1. *Threatened or impacted drinking water wells:* According to the Arizona Department of Water Resources (ADWR) records, there are 16 registered wells within ½-mile of the site. Of these registered wells, there are no exempt and one non-exempt well (#55-582080). This well was registered in July 2000, found to be dry at 549 feet bgs, and then abandoned in October 2000. There are 15 monitoring wells and none registered as other. The Town receives its municipal water from the EPCOR-Chaparral City public water system (AZ047017). According to the EPCOR *Chaparral City 2017 Water Quality Report*, there are approximately 13,700 service connections in the Town. The potable water is provided from a blend of Central Arizona Project canal of surface water from the Colorado River via Lake Havasu and also Lake Pleasant, and from groundwater withdrawn from two wells (#55-604786 and #55-604787) drilled into the deep aquifers. The wells are drilled to a depth of 750 feet bgs and draw water between 450 and 735 feet bgs, and 300 and 750 feet bgs, respectively. These two wells are located greater than 1 mile from the LUST site. As stated in the EPCOR *Chaparral City 2017 Water Quality Report*, in 2004 ADEQ completed a source water assessment for the two wells and one surface water intake used by EPCOR. The assessment reviewed the adjacent land uses that may pose a potential risk to the sources. These risks include, but are not limited to, gas stations, landfills, dry cleaners, agriculture fields, wastewater treatment plants and mining activities. Once ADEQ identified the adjacent land uses, they were ranked as to their potential to affect the water sources. The results of the assessment were that the two wells had no adjacent land uses in the vicinity and the surface water intake had one adjacent land use that posed a high risk to the source. According to the ADEQ Safe Drinking Water Database, there are no reported detections of volatile organic compounds (VOCs). It is noted that MTBE is not specifically listed in the VOC list. ADEQ sent out a Water Provider Questionnaire to EPCOR with the request that it be completed and returned within 30 days. EPCOR did not return the questionnaire.

2. *Other exposure pathways:* Historic soil data indicates no contamination present over applicable regulatory standards. Soil contamination (MTBE) was found at a depth of 25 feet bgs. Exposure by direct dermal contact or ingestion of contaminated soils is not likely due to the depth at which the contamination occurred. A shallow soil vapor survey from five locations was conducted in March 2018 to evaluate any potential vapor intrusion risk from the contaminated groundwater. Soil vapor samples were analyzed by Environmental Protection Agency (EPA) Method TO-15, for VOCs. Field and laboratory quality assurance/quality control (QA/QC) was acceptable. GES conducted the risk evaluation. GES evaluated both petroleum related CoCs and non-petroleum related CoCs. A cumulative cancer risk (ELCR) and a non-cancer hazard quotient (HI) value was calculated for each set of CoCs. The ELCR and HI for the petroleum related CoCs was 9.8E-07 and 1.9E-04, respectively. The ELCR and the HI for the non-petroleum related CoCs was 5.32E-08 and 0.76, respectively. All of these values represent acceptable risk since they are below 1E-06 and 1, respectively. Incidental dermal contact with the groundwater is considered *de minimis* risk. In a ¼ mile land use/receptor survey, there are no schools, day care centers, hospitals or other sensitive populations. There is an ephemeral (dry) wash located to the south and west of the site. The wash is shallow and groundwater elevations at the site exceed the elevation of the wash. Periodic checks of the northern wall of the wash by GES have never revealed any seeps or physical evidence that groundwater is reaching the surface and draining into the wash. No standing or flowing water has been observed in the wash to date by GES.

3. *Groundwater plume stability:* Groundwater monitoring has been done quarterly from 2005 to 2018. The groundwater plume has not migrated off site to Shea Boulevard. Groundwater elevations have remained between 13 and 33 feet bgs over the last decade, with an average approximate depth to water measurement of 23.72 feet bgs. GES conducted a trend analysis of MTBE concentrations in MW-1 and MW-5 (both located on site) using the GSI Mann-Kendall Toolkit for Constituent Trend Analysis. The summary of the analysis indicates that the MTBE is decreasing on both MW-1 and MW-5. These

concentration trends suggest long-term stability of the groundwater plume. Groundwater plume stability is also demonstrated by the remaining MTBE contamination present over a Tier 1 Corrective Action Standard is limited to monitoring wells MW-1 and MW-5, which are near the source area. MW-6, which did show MTBE historically, is down gradient of MW-5. This well is now dry likely due to the PersulfOx® collecting and precipitating into the fractured bedrock. The farthest down gradient monitoring well (MW-9) has not shown any VOC contamination. Based on groundwater data collected in March 2018, the MTBE concentration in MW-1 was 439 µg/L and 1,110 µg/L in MW-5. The highest MTBE concentration in MW-1 was 140,000 µg/L in April 2005. The highest MTBE concentration in MW-5 was 84,300 µg/L in February 2010. The historic VOC concentrations in groundwater have declined by several magnitudes. GES also evaluated plume stability using BIOSCREEN. The No Degradation and the 1st Order Decay models show that the MTBE contamination in MW-1 will be below the Tier 1 Corrective Action Standard of 94 µg/L between 65 and 75 feet away from the well within 10 years. The models show the distance to be between 45 and 60 feet in 20 years, between 30 and 45 feet in 30 years, and between 15 and 30 feet in 50 years. This data supports that the contaminant plume will continue to shrink over time.

4. *Characterization of the groundwater plume:* Groundwater samples have been collected at the site since 2004-2005 when the first three monitoring wells were installed. A total of nine monitoring wells have been installed. Two of the wells were located off site. Dissolved-phase petroleum hydrocarbons have been characterized in soil and groundwater as of March 2007. Based on groundwater data collected in March 2018, the MTBE concentration in MW-1 was 439 µg/L and 1,110 µg/L in MW-5. The highest MTBE concentration in MW-1 was 140,000 µg/L in April 2005. The highest MTBE concentration in MW-5 was 84,300 µg/L in February 2010. Benzene, toluene, ethylbenzene and total xylenes concentrations have been mostly below laboratory detection limits since at least 2007.

5. *Natural Attenuation:* Natural attenuation processes include diffusion, dispersion, sorption, volatilization, and biodegradation. A decreasing trend in CoC concentrations in groundwater has been established based on 13 years of groundwater monitoring data, which supports that natural attenuation is occurring. Hydrologic and geochemical data can be used to indirectly demonstrate the type(s) of natural attenuation processes. MTBE tends to resist biodegradation once dissolved in groundwater. Monitored natural attenuation (MNA) parameters were collected during the September 2017 monitoring event and indicate that within the source well at MW-5, biodegradation is occurring. When compared to the up and down gradient wells, nitrates and sulfates within MW-5 were low to depleted, while manganese was significantly higher. Oxygen reduction potential (ORP) values have consistently been negative in MW-5 and have fluctuated from positive to negative in MW-1.

6. *Removal or control of the source of contamination:* Source control has been completed by the UST system being permanently closed in November 1999. Approximately 882 tons of excavated soil was transported off site for thermal treatment and disposal. In 2005, Miller Brooks Environmental conducted quarterly vacuum over-purging of the monitoring wells using a “Stinger” to vacuum out the groundwater into a vacuum truck. In-situ chemical oxidation treatments of PersulfOx® were also used to treat the groundwater contamination in monitoring well MW-6 and in injection well (INJ-1) which was located near MW-7, in 2017. MW-1, MW-4 and MW-5 were not treated since there was concern of the oxidizer reacting and damaging the UST infrastructure.

7. *Requirements of A.R.S. §49-1005(D) and (E):* The results of the corrective action completed at the site assure protection of public health, welfare and the environment, to the extent practicable, the

clean-up activities completed at this site allow for the maximum beneficial use of the site, while being reasonable, necessary, and cost effective.

8. *Other information that is pertinent to the LUST case closure approval:* The facility and LUST files were reviewed for information regarding prior cleanup activities, prior site uses and operational history of the UST system prior to removal.

Groundwater data for MW-1 (on site source area)

Date	MTBE Tier 1 Standard 94 µg/L	Depth to water (feet)
April 2005	140,000	16.11
March 2006	42,000	17.89
February 2007	28,000	24.00
February 2008	29,000	19.62
February 2009	26,000	21.42
April 2010	12,000	27.42
May 2011	7,850	25.64
May 2012	5,780	26.65
May 2013	5,580	22.93
October 2013	5,890	19.65
May 2014	1,630	22.99
October 2014	1,960	19.50
October 2015	919	27.26
February 2016	625	23.71
May 2016	868	27.01
February 2017	429	24.17
May 2017	321	24.30
ISCO in MW-6 and INJ-1	--	--
ISCO in MW-6 and INJ-1	--	--
September 2017	421	25.03
December 2017	87.9	25.21
March 2018	439	25.29

Groundwater data for MW-5 (on site near source area)

Date	MTBE Tier 1 Standard 94 µg/L	Depth to water (feet)
February 2010	84,300	22.24
April 2010	38,000	32.07
May 2011	27,700	26.24
May 2012	21,100	27.25
May 2013	22,500	23.95
October 2013	33,800	20.78
May 2014	19,000	23.81
October 2014	15,100	20.47
October 2015	6,850	27.74
February 2016	9,500	24.18

May 2016	1,550	27.40
February 2017	1,730	24.02
May 2017	2,350	24.79
ISCO in MW-6 and INJ-1	--	--
ISCO in MW-6 and INJ-1	--	--
September 2017	1,040	25.59
December 2017	142	25.66
March 2018	1,110	25.75

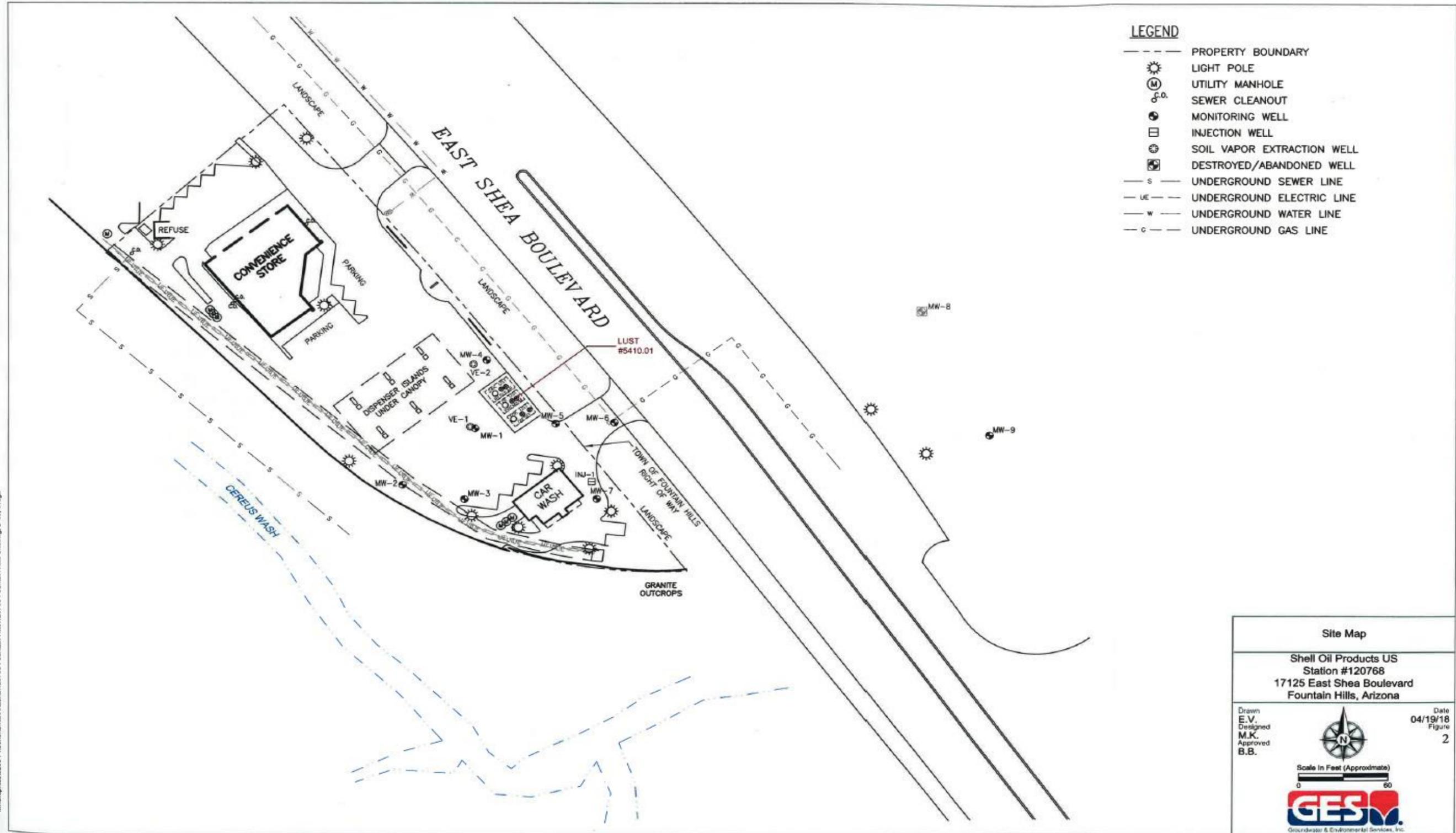
Site specific information concerning this closure is available for review during normal business hours at the ADEQ Records Center <http://www.azdeq.gov/function/assistance/records.html>, 1110 W. Washington St., Suite 140, Phoenix, AZ 85007. ADEQ welcomes comments on the proposed LUST case closure. Please call the Records Center at 602-771-4380 to schedule an appointment. A 30-day public comment period is in effect commencing **September 26, 2018 and ending October 26, 2018**. Comments should be submitted in writing to the Arizona Department of Environmental Quality, Waste Programs Division, and Attention: Jorge Espinosa, 1110 W. Washington Street, Phoenix, AZ 85007.

If sufficient public interest is demonstrated during the public comment period, ADEQ may announce and hold a public meeting. ADEQ will consider all submitted written comments and reserves the right to respond to those comments following the public comment period. For more information on this notice, please contact the Case Manager, Jorge Espinosa at (602) 771-4258 or at je5@azdeq.gov or the Sr. Risk Assessor, Debi Goodwin at (602) 771-4453 or at dg1@azdeq.gov.

Copies of the cited statutes and rules can be found at: <http://www.azleg.gov/ArizonaRevisedStatutes.asp?Title=49>, and http://www.azsos.gov/public_services/Title_18/18-12.htm

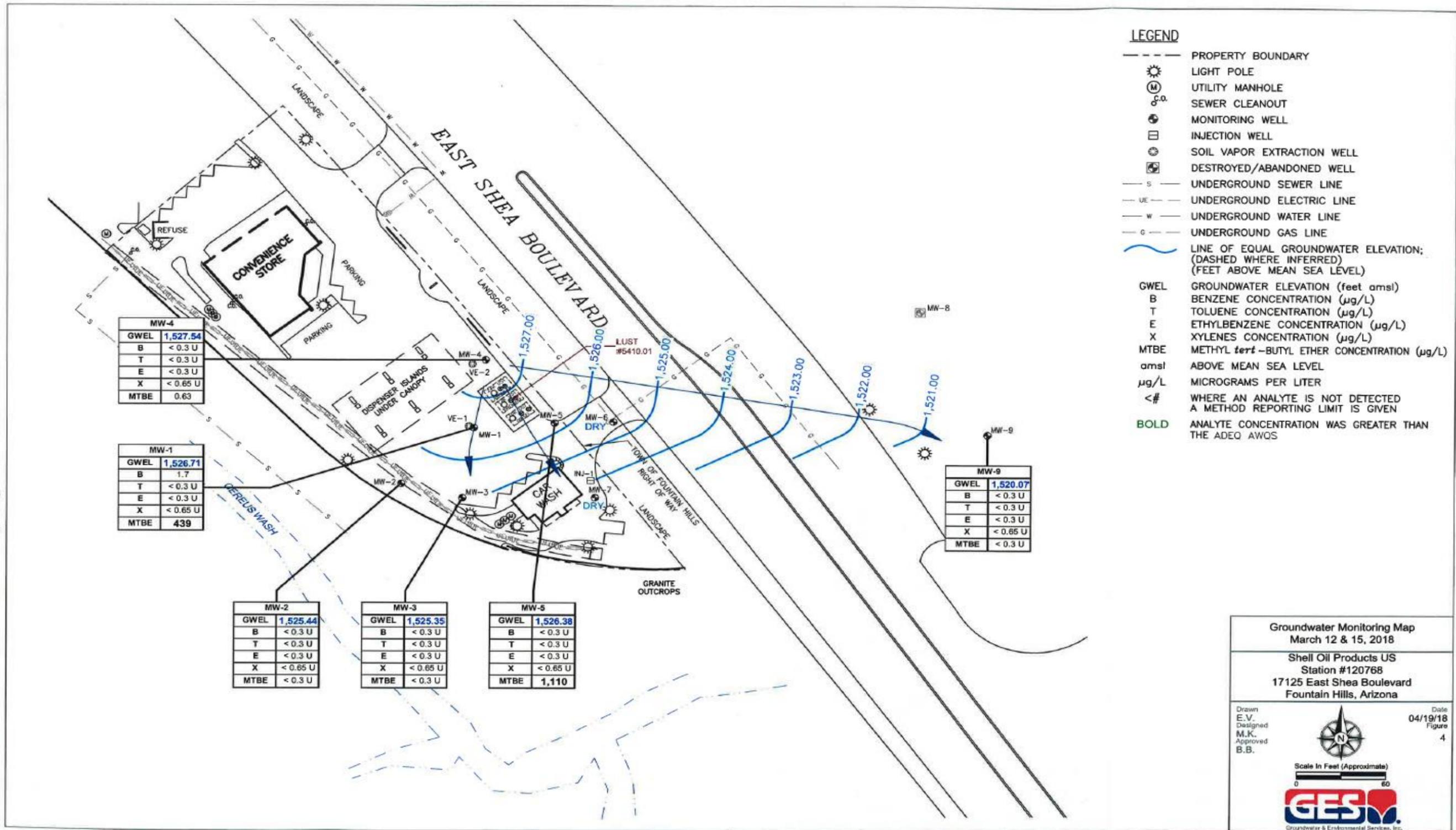
ADEQ will take reasonable measures to provide access to department services to individuals with limited ability to speak, write or understand English and/or to those with disabilities. Requests for language interpretation, ASL interpretation, CART captioning services or disability accommodations must be made at least 48 hours in advance by contacting Ian Bingham, Title VI Nondiscrimination Coordinator at 602-771-4322 or ibd@azdeq.gov. Tele printer services are available by calling 7-1-1 at least 48 hours in advance to make necessary arrangements.

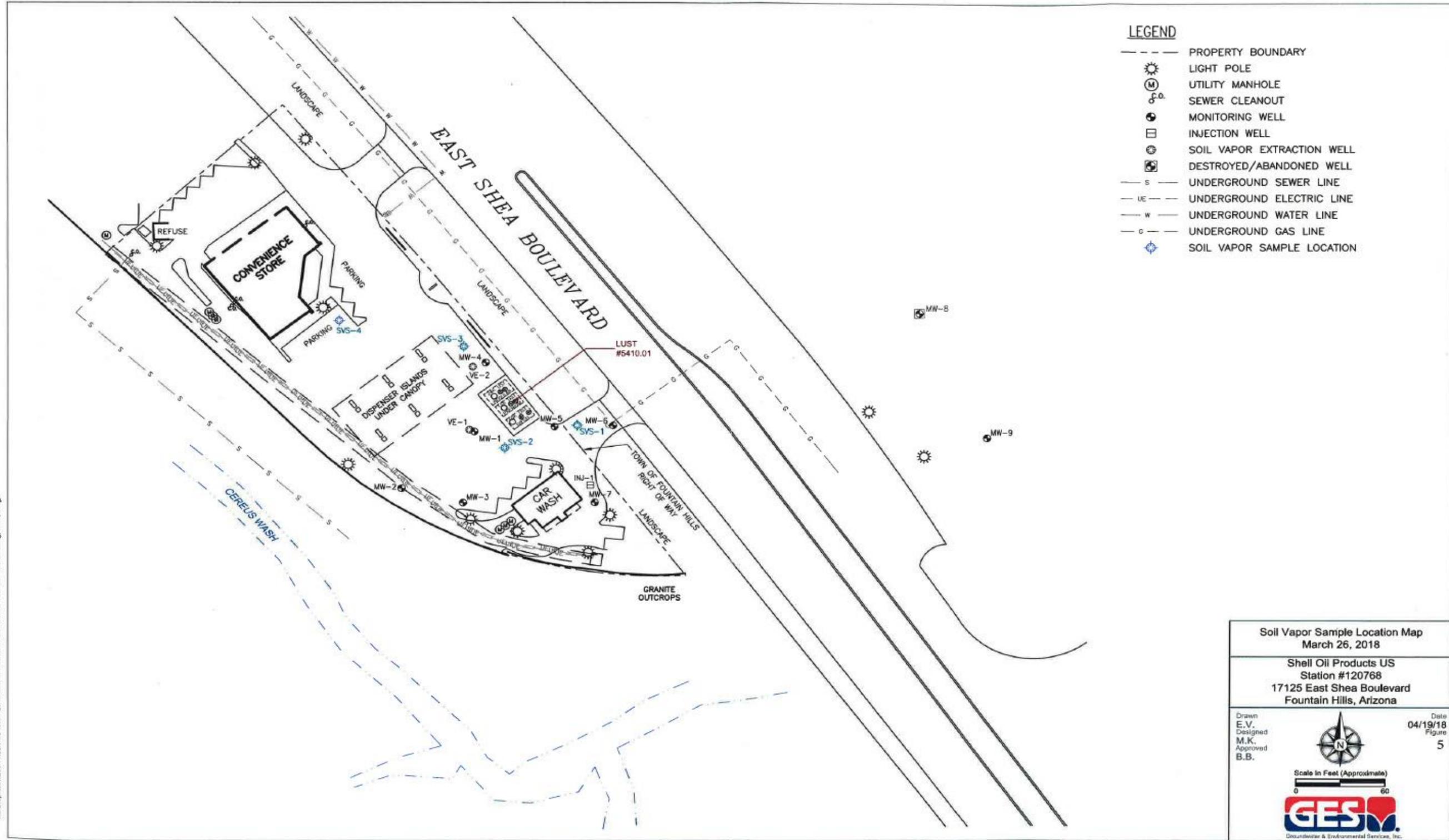
ADEQ tomará las medidas razonables para proveer acceso a los servicios del departamento a personas con capacidad limitada para hablar, escribir o entender inglés y / o para personas con discapacidades. Las solicitudes de servicios de interpretación de idiomas, interpretación ASL, subtítulos de CART, o adaptaciones por discapacidad deben realizarse con al menos 48 horas de anticipación contactando a Ian Bingham, Coordinador de Anti-Discriminación del Título VI al 602-771-4322 o ibd@azdeq.gov. Los servicios de teleimpresores están disponibles llamando al 7-1-1 con al menos 48 horas de anticipación para hacer los arreglos necesarios.



- LEGEND**
- PROPERTY BOUNDARY
 - ☀ LIGHT POLE
 - Ⓜ UTILITY MANHOLE
 - ⊕ SEWER CLEANOUT
 - ⊙ MONITORING WELL
 - ⊞ INJECTION WELL
 - ⊗ SOIL VAPOR EXTRACTION WELL
 - ⊘ DESTROYED/ABANDONED WELL
 - S — UNDERGROUND SEWER LINE
 - UE — UNDERGROUND ELECTRIC LINE
 - W — UNDERGROUND WATER LINE
 - G — UNDERGROUND GAS LINE

Site Map	
Shell Oil Products US Station #120768 17125 East Shea Boulevard Fountain Hills, Arizona	
Drawn E.V. Designed M.K. Approved B.B.	Date 04/19/18 Figure 2
	
Scale in Feet (Approximate) 	
	

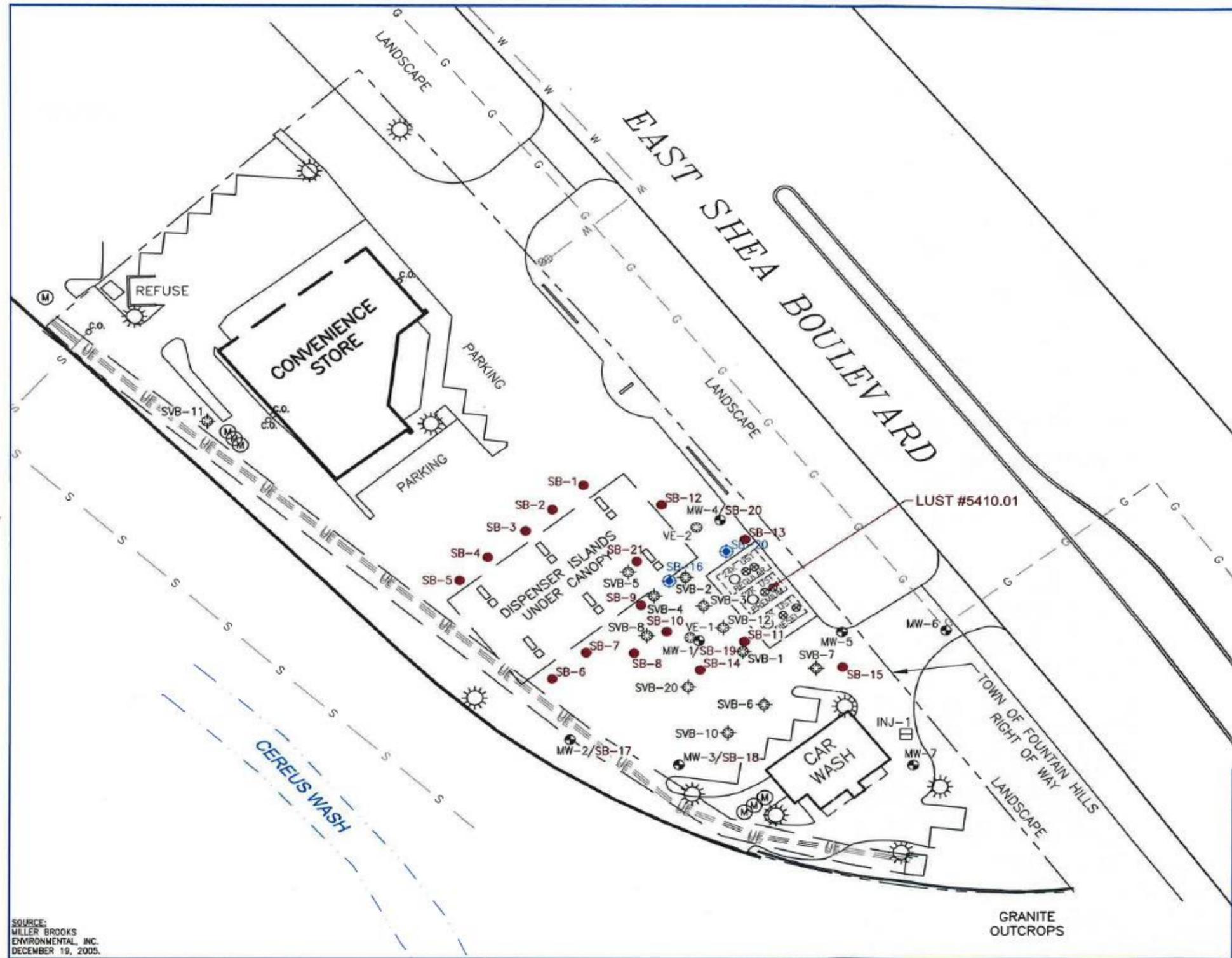






LEGEND

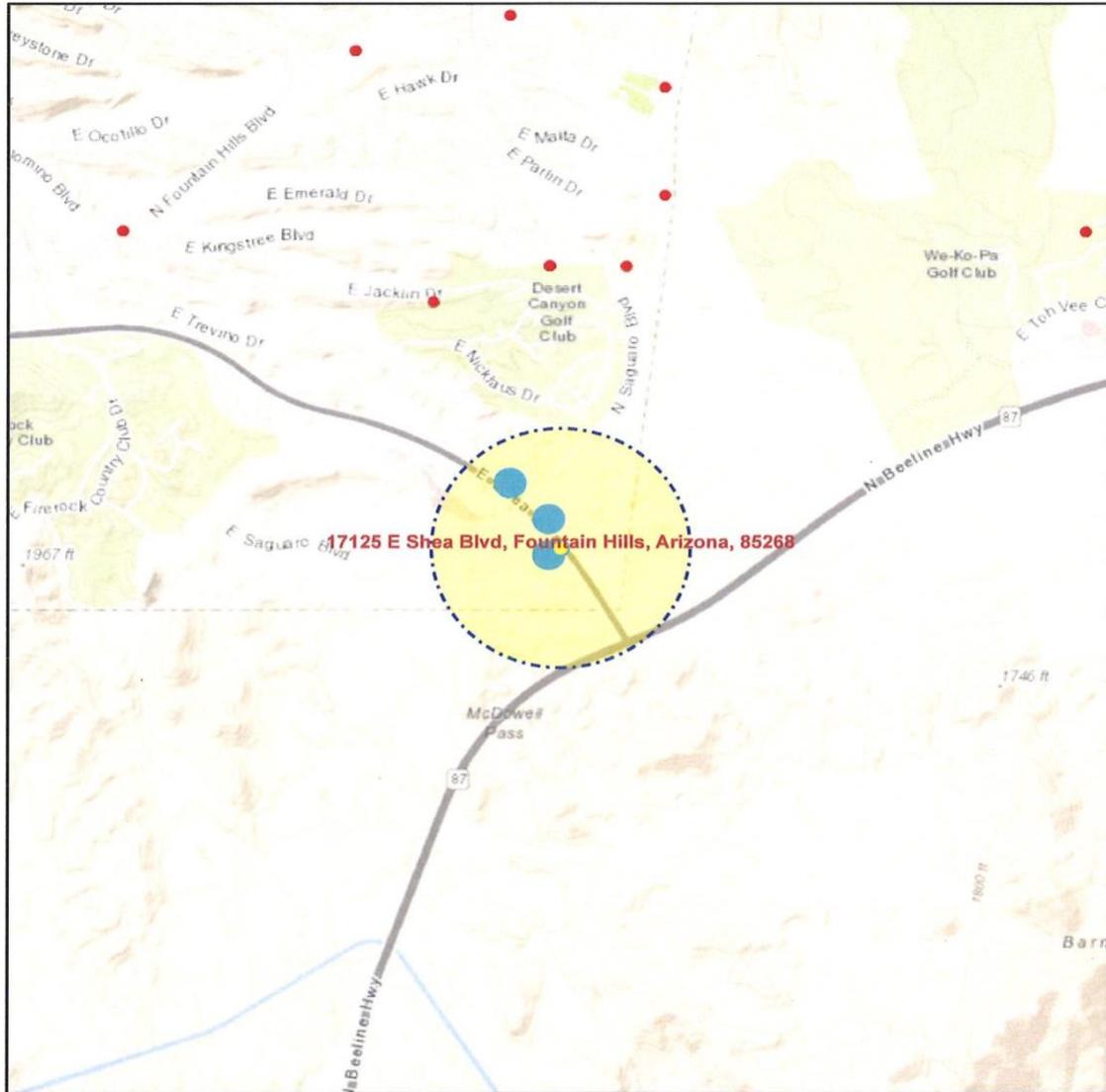
- PROPERTY BOUNDARY
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- ⊕ MONITORING WELL
- ⊕ INJECTION WELL
- ⊕ SOIL VAPOR EXTRACTION WELL
- ⊕ DESTROYED/ABANDONED WELL
- S --- UNDERGROUND SEWER LINE
- UE --- UNDERGROUND ELECTRIC LINE
- W --- UNDERGROUND WATER LINE
- G --- UNDERGROUND GAS LINE
- PHASE II SOIL BORING
- ⊕ SOIL BORING
- ⊕ SOIL VAPOR



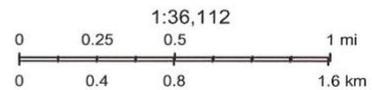
DRAFTED BY: E.V.	SOIL SAMPLE LOCATION MAP		
CHECKED BY: A.F.	SHELL OIL PRODUCTS US STATION #120768 17125 EAST SHEA BOULEVARD FOUNTAIN HILLS, ARIZONA		
REVIEWED BY: B.B.	Groundwater & Environmental Services, Inc.		
NORTH 	SCALE IN FEET 0 APPROXIMATE 40	DATE 10-27-16	FIGURE 6

SOURCE:
MILLER BROOKS
ENVIRONMENTAL, INC.
DECEMBER 19, 2005.

Former Shell Station #120768



September 10, 2018



Arizona Department of Water Resources. Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS

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